PUBLICATION No. 117
SECOND EDITION

WATSON

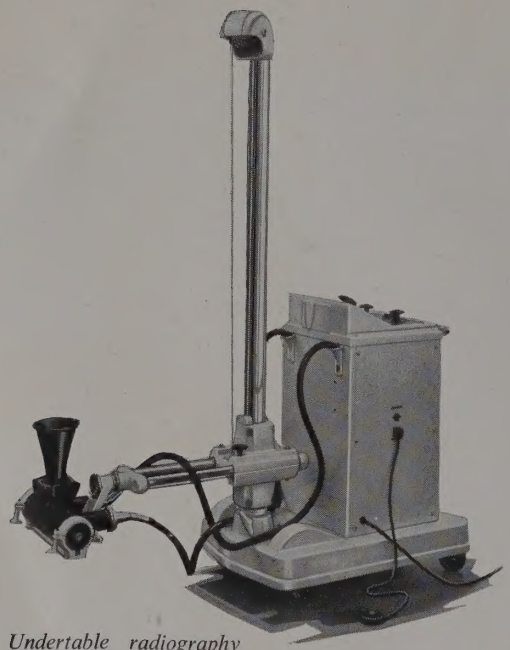
British made
X-RAY APPARATUS

WATSON
WEMBLEY

"MOBILIX" WARD OUTFITS

WATSON & SONS (ELECTRO-MEDICAL) LTD

WATSON
"MOBILIX"
—a product of long experience



Undertable radiography or fluoroscopy.

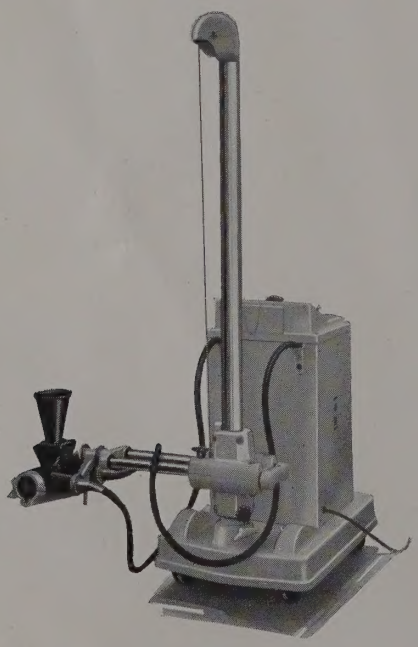
There are few limitations to the scope of the radiographic work which can be undertaken successfully in the ward with the aid of the latest type of " Mobilix " x-ray outfit. Exposure times are short, and radiographic quality excellent.

The Mobilix Outfit minimises the difficulty of positioning the x-ray tube within a confined space. Not only can it be propelled readily in a forward direction, but it can also be turned within its own length, and the tube can be placed over the control panel for added ease in manoeuvring.

Two types of Mobilix Outfit are now available: the standard model having an output of 95 kV. and 60 mA., and the Mobilix 100 which is equipped with a rotating anode tube, and has a maximum output of 90 kV. and 100 mA.

The use of the Mobilix is not always confined to ward radiography. It is ideal for casualty work and also forms an invaluable standby in the event of the stationary installation being out of action. Chest radiography and fluoroscopy of a high standard is achieved, especially in conjunction with the Watson Fluoroscopic Attachment (Publication 575) which is made to fit at the end of the Watson Radiographic Table (Publication 408).

The present Mobilix Outfit is a rational development from the earlier series which, manufactured in very large quantities, has earned an international reputation for exceptionally good performance and reliability under all conditions. Every part is made to fine limits of accuracy to ensure consistency and interchangeability.



When space is restricted the tube-stand can be rotated.

For compact storage or during transit, the tube can be placed over the control panel.

THE MOST WIDELY USED WARD OUTFIT

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THE STANDARD "MOBILIX"

Specification

The Transformer. High tension and filament transformers are housed together in a container filled with oil by a vacuum impregnation process which minimises the risk of breakdown.

The shockproof cables from the x-ray tube are plugged into sockets at the top of the transformer, no high tension connections being exposed at any point in the equipment.

The Tube Stand. In place of the usual counterweight, which is heavy and permits of only a limited range of travel, the "Mobilix" is equipped with a compensated spring counterpoise, resulting in exceptionally light adjustment of the x-ray tube from the top to extreme bottom of the tube column. As with the tube cross-arm, the vertical carriage runs on ball-bearings, and can be locked at any position.

The tube column may be rotated through 360° to bring the tube over a bed at any angle to the control panel, or in such a way that the tube is directly over the panel, thus making the apparatus more compact for storage and for moving about the hospital.

The x-ray tube can be rotated through 360° on its short axis and 130° on its long axis, the degree of angulation being indicated by scales. Other scales show the height of the tube focus from the floor and the transverse movement on the cross-arm.

The X-Ray Tube. The "Mobilix" is equipped with a Machlett "Aeromax 8C" shockproof oil-immersed tube with a heavy anode and 3.2 mm. focus. Special advantages of this tube are: exceptional reliability, mechanical strength, small dimensions, minimum inherent filtration, and immunity to atmospheric conditions. The tube may be used for fluoroscopy for periods up to ten minutes at the highest value of kilovoltage, and almost indefinitely at the lower values.

The Control Panel. The following features are embodied on the control panel:—

- Line Voltage Compensator with eight points of control.
- Voltmeter, indicating when mains compensator has been correctly adjusted.
- Watson Synchro-timer with 0.1 to 8 seconds range. Consistently accurate and reliable. Being self-setting, it is particularly convenient when used in conjunction with a serial device since exposures can be repeated automatically.
- Kilovoltage Control selecting the following values:—

Stud	*Radiography*		*Fluoroscopy*	
	kV.	mA.	kV.	mA.
1	43	60	45	2.3
2	51	56	52	2.3
3	59	53	60	2.3
4	67	50	67	2.3
5	74	47	74	2.4
6	81	44	81	2.4
7	88	42	87	2.5
8	95	40	94	2.5

- Milliammeter scaled 0–6 and 0–60 mA. for fluoroscopy and radiography respectively, with automatic switch-over.
- Fluoroscopy—Radiography Changeover Switch.
- Pilot Light indicating when the apparatus is energised.
- Potter-Bucky Diaphragm Switch for use with electrically released diaphragms.
- Exposure Switch for radiography.

Continued on page 5.

The Control Panel of the "Mobilix" is conveniently arranged, and has large, clearly marked dials. A pilot light indicates when the apparatus is energised.

Special MOBILIX features

SPRING COUNTERPOISE

Provides greater range of vertical travel than counterweight, with easy movement and light weight.

TUBE CROSS-ARM

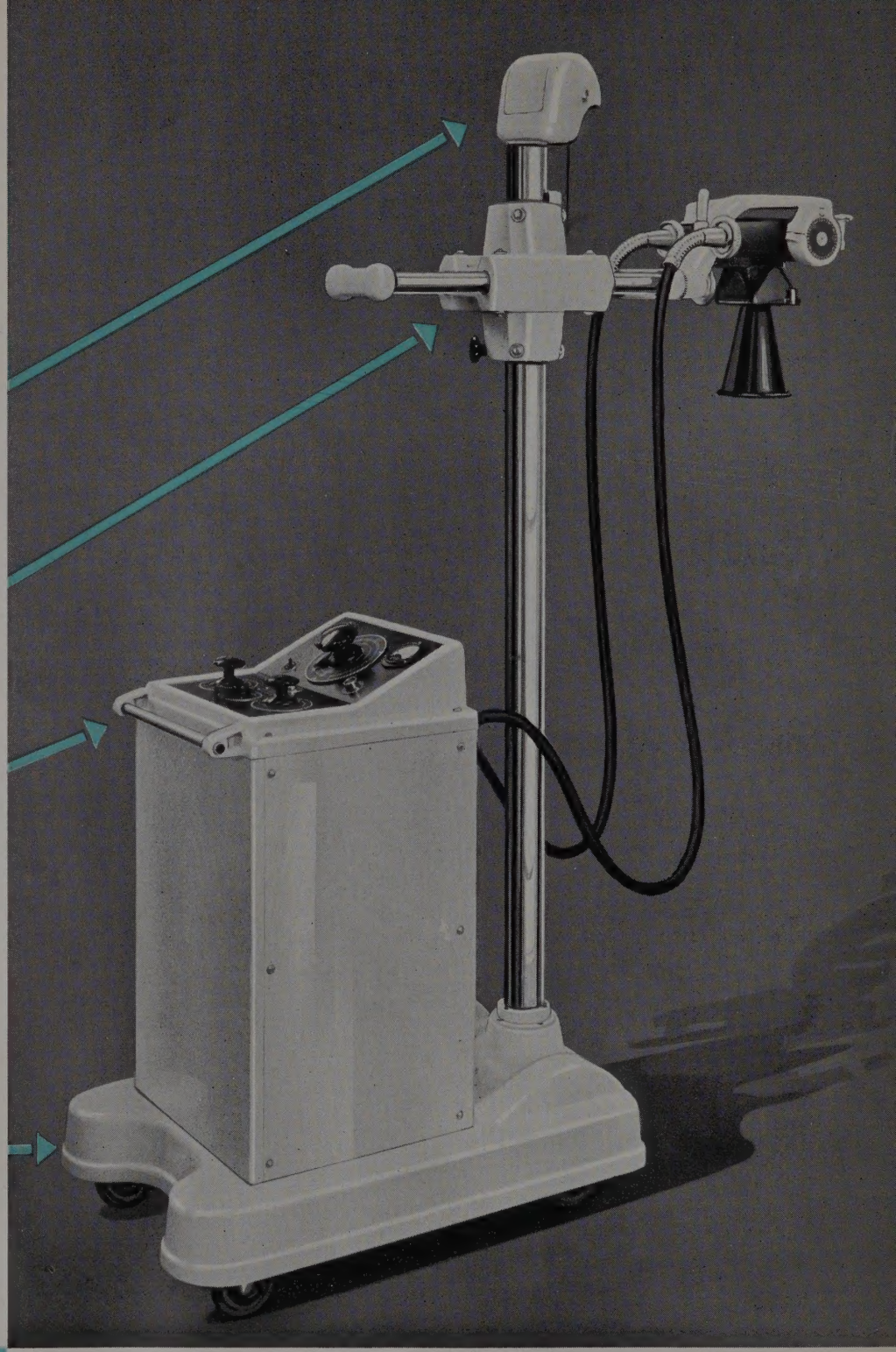
Runs smoothly on ball bearings. Clear scale, quick-acting brake.

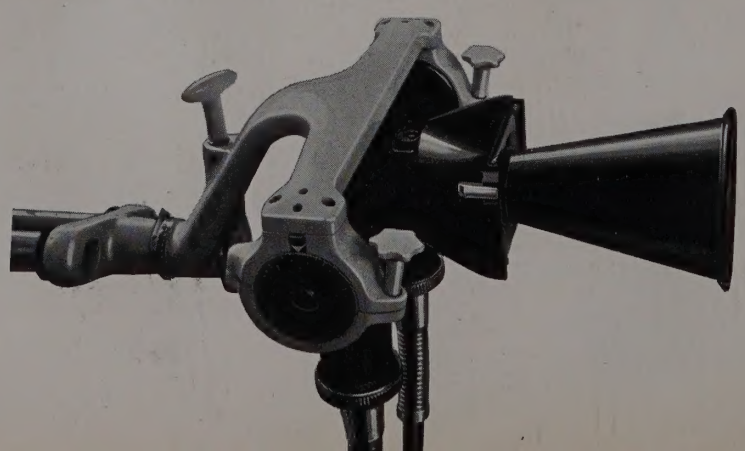
CONTROL PANEL

Has all the refinements of an up-to-date x-ray installation with precision controls and meters. For full description see page 3 (Standard model) or page 6 (Mobilix 100)

MOBILE BASE

Equipped with large diameter rubber tyred wheels and swivelling castors.





An improved type of trunnion-mounting permits the x-ray tube to be rotated on its long axis through 130°—a valuable facility for lateral chests of bedridden patients and for operating theatre work.

There are two sockets on the side of the control table; one for the lead from the Potter-Bucky diaphragm, and the other for a footswitch lead. The footswitch, supplied as an extra, is for use during fluoroscopy.

An ivorine chart which fits in a slot at the back of the control panel gives recommended exposures. *The x-ray tube cannot be overloaded on any exposure* by virtue of the automatic loading features provided by the kilovoltage control.

Mains Supply. The apparatus is designed to operate from A.C. single phase supplies of 100 to 250 volts, 40 to 60 cycles. Consumption at maximum load on a 230-volt supply is approximately 30 amperes.

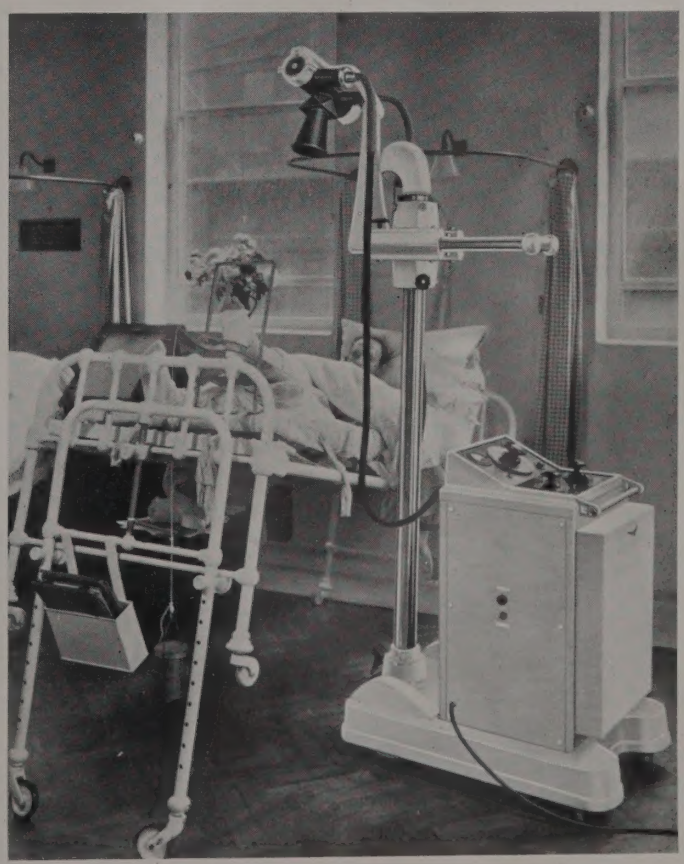
For Direct Current mains, a suitable rotary converter can be supplied at extra cost.

Finish. The apparatus is faultlessly finished in chromium plate and high grade " broken white " stoving enamel.

EXPOSURE CHART

Region	Aspect	kV. Stud	Exposure (Seconds)
Hand, Wrist, Forearm ...	A.P.	1	0.3
Elbow	A.P. & Lat.	2	0.8
Foot, Ankle	A.P.	2	0.8
,, ,, ...	Lat.	2	0.6
Tibia and Fibula	A.P. & Lat.	3	0.5
Knee	A.P.	3	0.5
,, ...	Lat.	3	0.3
Shoulder	A.P.	3	0.5
Pelvis, Hip	A.P.	4	3.5*
Femur	A.P. & Lat.	3	0.8*
Spine, Lumbar	A.P.	5	2.0*
,, ,, ...	Lat.	6	6.0*
,, Dorsal	A.P.	5	3.0*
,, ,, ...	Lat.	4	4.5*
,, Cervical at 48″ (1.2 m)	A.P.	3	2.5*
,, ,, ,, ,, ,,	Lat.	4	1.5
Skull	Occ. Front	5	3.0*
,, ...	Lat.	4	1.5*
Chest At 60″ (1.5 m.) ...	P.A.	6	0.2
,, ,, 48″ (1.2 m.) ...	Lat.	6	0.6
,, ,, 48″ (1.2 m.) ...	Oblique	6	0.4
Barium Meal	A.P.	5	0.5*
Gen. Urin. Tract	A.P.	5	2.5*

Focus/film distance 30″ (76 cm.) except where otherwise stated.
* With Potter-Bucky diaphragm. When using a Lucidex grid take two-thirds of the exposure times given.
The exposure times are based upon the use of standard speed x-ray film with Sunic Tungstate Intensifying Screens.



TUBE STAND EXTENSION
Where it is desirable to have the greatest possible tube height, an extension casting can be provided which increases the height by 1 ft. 6 ins. (.46 metres) but unavoidably adds a similar amount to the minimum undertable distance. The illustration shows the value of this extension. (*Cat. No.* 117/5).

THE "MOBILIX 100"

Specification

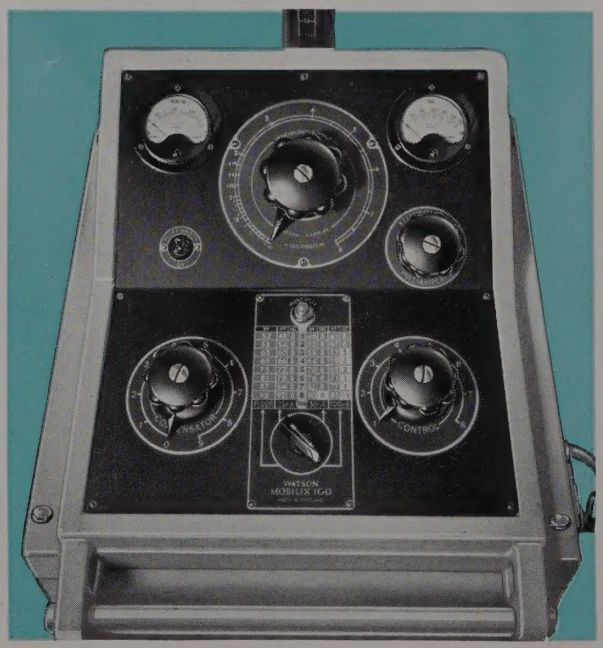
This is a more powerful version of the standard "Mobilix" to which it is similar in all respects except the following:

The x-ray tube is a Machlett Dynamax 20 lightweight rotating anode tube with 1.3 mm. focus. The high ratings of the tube enable full use to be made of the generous current output of the high tension circuit. It is capable of rendering superb detail in bone radiography, and also affords adequate capacity for rapid chest and G.I. radiography. The tube is mounted in a new type of trunnion permitting 360° of rotation on its short axis and 130° on its long axis. Clear angulating scales are provided, and rigid clamps for all movements.

The kilovoltage control gives eight compensated values of kilovoltage as follows:

Stud	*Fluoroscopy*	*Radiography*		
	3 mA.	25 mA.	50 mA.	100 mA.
1	52	48	46	41
2	58	54	52	47
3	63	60	58	53
4	69	66	64	59
5	75	72	70	65
6	81	78	76	71
7	87	84	82	77
8	95	92	90	85

The tube current is selected by means of a four-position control incorporated in a Monitor Control Chart indicating the maximum exposure duration permissible and the kilovoltage at each stud of the kilovoltage control for the appropriate milliampere setting.



The control panel of the Mobilix 100 showing the Monitor Control chart.

The milliammeter is scaled 0–6 and 0–120 mA. for fluoroscopy and radiography respectively, with automatic switchover. Fluoroscopy can be continued indefinitely at 3 mA. up to 81 kV., and for three minutes in each five at higher kilovoltage values.

The Exposure Handswitch, connected to the control by a flexible cable, has a two-position concentric press-button. Pressure on the central button energises the tube stator, and after the expiration of the short delay period the exposure can be initiated at will by further pressure on the outer ring.

The handswitch operates in conjunction with a Watson synchro-timer with an expanded scale over the range 0.05 to 8 seconds. For repeat exposures of similar duration it is not necessary to reset the timer.

A Cassette Storage Box is fitted to the front of the unit and will accommodate cassettes up to the largest available size.

Mains Supply. A mains cable 30 feet (9 metres) long, and of substantial cross-section, is attached permanently to the unit and accommodated on cleats at the back of the control. Thermal overload circuit breakers are fitted on each pole of the mains supply. These are adjustable to suit different mains input conditions.

The apparatus is designed to operate from A.C. single phase supply mains of 100 to 250 volts 50 cycles (40 or 60 cycles to special order). Consumption at maximum output on 230 volt mains is 60 to 70 amperes; consumption at 50 mA. approximately 30 amperes.

For maximum output, mains supply regulation should not be greater than 7% at a load of 15 kVA. However, operation at the lower mA. settings can be satisfactorily carried out in wards where the mains regulation is up to at least double this figure.

MOBILIX 100
EXPOSURE CHART

Region	Aspect	kV. Stud	mA.	Exposure (Seconds)	Distance	
					Inches	Metres
WRIST	A.P.	3	50	0.2n	30	0.76
,, ...	LAT.	4	50	0.25n	30	0.76
ELBOW	A.P.	4	50	0.4n	30	0.76
,, ...	LAT.	4	50	0.4n	30	0.76
SHOULDER	A.P.	2	50	0.5	36	1.0
FOOT	A.P.	6	50	0.2n	30	0.76
ANKLE	A.P.	5	50	0.3n	30	0.76
,, ...	LAT.	4	50	0.3n	30	0.76
KNEE	A.P.	3	50	0.2	36	1.0
,, ...	LAT.	3	50	0.15	36	1.0
PELVIS, HIP	A.P.	4	50	2.5*	36	1.0
SPINE, LUMBAR ...	A.P.	5	50	3.0*	36	1.0
,, ,, ...	LAT.	8	50	5.0*	36	1.0
SPINE, DORSAL... ...	A.P.	7	50	1.5*	36	1.0
,, ,, ...	LAT.	7	50	3.5*	36	1.0
SPINE, CERVICAL ...	A.P.	4	50	1.0*	36	1.0
,, ,, ...	LAT.	4	50	1.0	60	1.5
SKULL	P.A.	4	50	3.0*	36	1.0
,, ...	LAT.	3	50	2.0*	36	1.0
CHEST	P.A.	4	100	0.2	60	1.5
,, ...	LAT.	8	100	0.25	60	1.5
GEN. URIN. TRACT ...	A.P.	4	100	1.0*	36	1.0
B.M. STOMACH ...	A.P.	6	100	0.5+	30	0.76

n = Non-screen film.
* = With Potter-Bucky diaphragm. When using a Lucidex grid take two-thirds of the exposure times given.
+ = With Lucidex grid.
The exposure times are based upon the use of standard speed x-ray film and Sunic Tungstate Intensifying Screens.

ORDERING INFORMATION

STANDARD MOBILIX

Cat. No.

117/1 **Mobilix Ward Outfit.** (60 mA.) including High Tension Cables, Footswitch and Applicator* but without X-Ray Tube.

C473A **X-Ray Tube for above, Machlett Aeromax 8C.**

EXTRA

117/6 **Rotary Converter** to enable apparatus to be operated on Direct Current supplies.

MOBILIX 100

Cat. No.

117/10 **Mobilix 100 Ward Outfit.** (100 mA.) including Cassette Storage Box, Overload Circuit Breakers, Tube Stator Control, High Tension Cables, Footswitch and Applicator* but without X-Ray Tube.

C673A **X-Ray Tube** for above. Machlett Dynamax 20.

EXTRA

117/11 **Rotary Converter** to enable apparatus to be used on Direct Current Supplies.

EXTRAS COMMON TO BOTH MODELS

Cat. No.

117/5 **Tube Stand Extension** to increase overtable tube distance.

117/7 **Adjustable Square-Leaf Diaphragm** and manipulating handle.

* Additional slide-in type applicators in various sizes or alternatively an adjustable diaphragm with built-in centre finder can be supplied to order. For details see Watson publication No. 623.

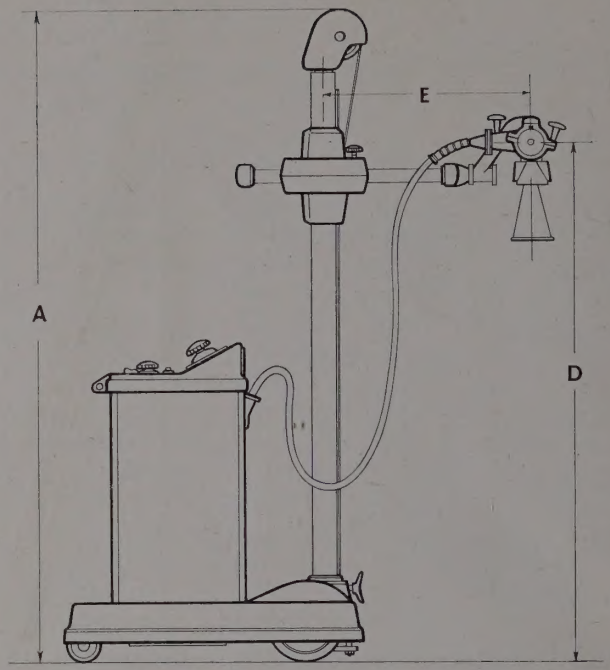
FOR DETAILS OF RADIOGRAPHIC AND DARK-ROOM ACCESSORIES
PLEASE ASK FOR SEPARATE PUBLICATIONS.

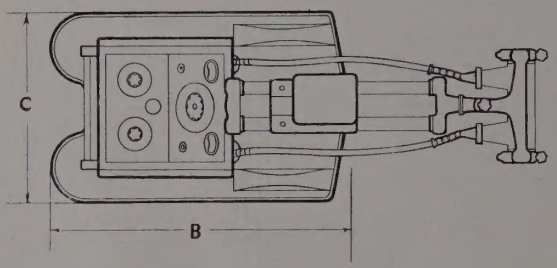
DIMENSIONS

(The external dimensions of the standard Mobilix and the Mobilix 100 are identical).

	Ft.	In.	Metres
A	6	9	2.05
B	3	1	0.94
C	1	11½	0.60
D (Maximum) ...	5	10½	1.80
(Minimum) ...	1	0½	0.32
E (Maximum) ...	2	5½	0.75
(Minimum) ...	1	4½	0.42

NOTE: In cases where the apparatus is to be used in a building with doorways or lifts less than the overall height, the tube-column can be shortened. The over-couch distance can then be maintained by the use of the Tube Stand Extension. (*Cat. No.* 117/5).





SHIPPING INFORMATION

Contents	Nett Weight	Gross Weight	Dimensions
Control, Cables, Crossarm, Footswitch, Applicator, and Instructions.	cwt. qr. lb. 2 1 19 (122 kg.)	cwt. qr. lb. 3 3 23 (200 kg.)	3′ 6″ × 2′ 5″ × 3′ 9″ (106 × 73 × 114 cm.)
Tube Stand and Crossarm Counter-weights	0 2 25 (36 kg.)	1 1 8 (67 kg.)	7′ 0″ × 1′ 4″ × 1′ 1″ (213 × 40 × 33 cm.)
Transformer	1 1 11 (68 kg.)	1 2 24 (87 kg.)	1′ 9″ × 1′ 5″ × 1′ 9″ (53 × 43 × 53 cm.)
X-Ray Tube (Aeromax)	0 0 19 (8 kg.)	0 1 7 (15 kg.)	1′ 9″ × 1′ 2″ × 1′ 6″ (53 × 35 × 45 cm.)

For the Mobilix 100 add 5 lb. (2.3 kg.) to the weight.

Whilst every care is taken to ensure the accuracy of the description and illustrations in this publication, Watson & Sons (Electro-Medical) Ltd., reserve the right to make such alterations in the design of the apparatus as they may consider to be in the interest of the customer. All orders are accepted subject to the Company's printed Conditions of Sale.

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